

# Wireless Network Helps Mercy High School Implement Innovative Academic Computing Program

## Case Study

### Background

Founded in 1945 by the Sisters of Mercy, Mercy High School has remained true to its mission: providing an excellent education for young women. Mercy is an independent, Catholic college preparatory school that fosters individual learning through personal attention, small classes and close relationships between students and faculty. The school continues to be the hallmark of educational excellence, being one of the first private schools in the nation to be named exemplary by the United States Department of Education and the Council for American Private Education (CAPE). Ninety nine percent of the school's graduates go on to college, with many of them attending the finest colleges in the country.

In the business of educating young women who make a difference and aware of how technology is increasingly present in all careers and social services, Mercy High School established its Student One-to-One Computing Program. The program was developed in recognition of research that has found that students with their own computing device have the highest likelihood of becoming proficient with computer-related technologies.

"Realizing the role of technology in organizational functioning and its critical role in education, Mercy High School is continuously working to implement technology in service to the vitality of its mission. As such, the Information Systems Department works with every department to assess practices and to introduce the technology where necessary to improve functioning and level of service," explains Adele Stommel, Mercy High School's Director of Information Services.



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*Adele M. Stommel, IHM  
Director of Information Services  
Mercy High School  
Farmington Hills, Michigan*

### Challenge

With the first phase of *One-to-One* scheduled to begin in the fall of 2005, the Mercy administration recognized that the ability of the school's data network to support the program would be critical to the program's acceptance, adoption and success.

With typically one cable drop in each classroom, the school's existing cable plant and power infrastructure were not capable of supporting the increased number of computing devices and network traffic that would result from the *One to One* program. The existing wireless network provided just enough capacity and coverage to limited areas of the school to support faculty use.

In late 2004, Mercy High School began an analysis of the network requirements resulting from *One-to-One* and evaluated options and costs for upgrading facility infrastructure to support the program as well as other future networking requirements. Ultimately there would be a need to support nearly 850 tablet and notebook users throughout the school.

### Solution

After investigating alternatives for improving the network infrastructure to support the *One-to-One* program and general networking requirements, Mercy High School elected to implement a wireless LAN to meet its requirements and selected Azure Solutions of Rochester Hills, MI to provide a facility-wide wireless design capable of providing up to 54 Mbps of capacity throughout the Mercy facility.

First, Mercy and Azure evaluated Mercy's current and long-term requirements and existing network infrastructure in order to establish a wireless network design that would support *One-to One* and the school's long-term networking needs. To serve Mercy's long-term needs, it was critical to understand future applications and uses and incorporate their requirements into network capacity and performance planning. Azure also assisted in Mercy's evaluation of the wireless networking solutions offered by several manufacturers. The school was mindful of its limited IT staff resources and placed a high value on a network solution that would provide simplified management and diagnostics while leveraging existing network infrastructure and providing the highest levels of security.

Azure then conducted a site survey at the Mercy facility. The survey, which included spectrum analysis, the determination of optimal access point and antenna placement and the selection of appropriate antennas allowed Azure to provide a network design that ensured coverage, capacity and roaming capabilities.

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"This design was independent of a particular wireless manufacturer which was greatly appreciated as it gave the internal team the opportunity to think through what we specifically needed. The documentation which accompanied the design gave us what we needed wiring closet by wiring closet. This and the detailed location of the access points saved us considerably project management time and real costs when we put out a bid for the cabling needs and then relocated existing cable or installed new," Stommel continues.

After evaluating Azure's design and the offerings of several wireless network manufacturers, the school elected to have Azure provide and implement Aruba Networks' wireless mobility system.

Of particular interest to Mercy was the Aruba mobility controller, which combines powerful packet processing with 10/100/1000 Mbps Ethernet switching, stateful firewall, VPN termination, wireless intrusion protection, and advanced RF management-all within a single network device that included web accessibility. The Aruba mobility controller would also integrate seamlessly and non-disruptively into Mercy's existing wired network with no logical or physical re-configuration required.

"We chose Aruba for achieved quality in the field and its centralized switch design. Also, we are a school. Our IS Department places an extremely high value on support and maintenance requirements. The product has to get us where we are going, last the distance and not need constant support or high-end engineers for maintenance. Aruba's centralized and web-based management is just great," says Stommel.

## Results

By the beginning of the 2005 school year Mercy High School's wireless local area network was installed and operational. The new 802.11g wireless network provides up to 54 Mbps of wireless network capacity throughout the 250,000 square feet of the Mercy facility, supporting the initial phase of the *One-to-One* program as well as other current student, faculty and staff networking needs. The system also provides capacity and functionality for supporting future networking requirements.

"No place is inaccessible now. We see more teachers bringing their computers into meetings to take notes as the connection is not dropping. They are using previously "dead" moments to finish up on their attendance, grade book or some other item of work. We anticipate this will be no different with the students, providing more time on task within their own workflow," reports Stommel.

"The system provides centralized control of all access points, dynamic RF management without having a separate system of remote RF sensors, web-based administration and troubleshooting and integrates seamlessly into our current network infrastructure. From the standpoint of security, it provides the ability to track, log, block or limit network traffic right down to the user level based on rules and policies using the firewall module. With Azure's high capacity network design and the Quality of Service features and ability to prioritize different traffic types provided by the wireless system, we have a network that will support our long-range plans for voice, video and data traffic," states Tom James, Mercy's Network Administrator.

"The centralized switch architecture of the new wireless network meets the schools requirements for high performance security and network management without requiring extensive staff resources and support. The system gives administrators a single point of control from which to locate and shut down rogue access points, identify and thwart malicious attacks and impersonations, load-balance traffic, detect coverage holes and interference and create stateful, role-based security policies that follow users as they move," states Dave Witek, Azure's Project Manager.

"It has been a true pleasure working with Mercy High School. From the perspective that specific applications are driving the design and development of the wireless network, Mercy's approach to this network is similar to that of the Fortune 500 companies to whom we are currently providing wireless networks. More frequently we are engaged by the early adapters of wireless networks who are beginning to realize that their legacy networks, primarily built to provide coverage with little regard for capacity or mobility, are falling short of supporting business applications. Mercy took the time to establish both current and long-term system requirements which enabled us to provide a design that will meet their requirements not only for the student computing program but for other future applications," reports John Polakowski, president of Azure Solutions.

"Azure Solutions was recommended by several sources and provided us with the highest levels of service and satisfaction. Their expertise became apparent as they helped us through the process of evaluating alternatives and implementing a wireless network that meets our needs not only for today but in anticipation of tomorrow's additional requirements."

*Will Gervais  
Associate Principal  
Mercy High School*

## Mercy's Student Computing Program

While Mercy's teachers are entering the fifth year of the use of laptop computers for electronic grade books, attendance and other administrative applications, the 2005 school year would see the beginning of the school's student computing program, *One-to-One*. This program is intended to provide an environment for critical learning and the extensive use of computing in the course of the school day at Mercy. The computing technologies and applications include:

- Discourse<sup>®</sup> software developed ETS and provided by HP<sup>®</sup> for the Michigan Freedom to Learn program enables teachers to pose quick questions to the class and instantly gauge each student's level of comprehension of a topic by real time class surveying by monitoring each student's response and gaining unparalleled insight into the student's comprehension.
- Productivity software geared for student success in note-taking, remembering and power studying are all an integral part of the student learning environment enabled by the use of the Microsoft<sup>®</sup> Education Pack for Windows XP Tablet<sup>®</sup>. Among other functions, this "ink technology" allows students to take notes on imported documents, convert handwritten notes to digital format and create electronic flashcards.
- Mindjet<sup>®</sup> MindManager<sup>®</sup> software is also used to enhance the teaching and learning experience, helping students study, create outlines, organize research, and present complex information to classmates and teachers and faculty to develop and deliver engaging content that enables students to apply academic concepts to the world around them.

Additional *One-to-One* partners include CDW-G, the system integrator for the program's HP<sup>®</sup> tablet computers and Credit Union ONE, the financing partner for the student computing program.

Mercy continues to evaluate other innovative applications like DyKnow<sup>®</sup>, which fosters interactive classroom instruction and allows teachers to control and monitor student desktops, providing the ability to view all student screens as thumbnails and to select one to view in detail. Teachers can watch student progress and identify meaningful work upon which to collaborate and quickly assess how well concepts are being understood by viewing student work and adjust lesson timing and pace.

## Azure Solutions

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